

WHAT IS CLAIMED IS:

1           1. A printer control unit for issuing a command to a printer that  
2   is able to perform double-side printing, comprising:  
3           mode designation receiving means for receiving the designation of  
4   double-side printing mode in which both surfaces of a printing medium  
5   are target surfaces to be printed;  
6           command generating means for generating a feed command for  
7   correcting the timing of feeding the printing medium, in the case where  
8   said mode designation receiving means receives the designation of  
9   double-side printing mode, for printing a second image that is to be  
10   printed later out of a pair of images to be printed on both surfaces of said  
11   printing medium; and  
12          command issuing means for issuing said feed command generated  
13   by said command generating means as said command to be supplied to  
14   said printer.

1           2. A printer control unit for issuing a command to a printer  
2   which suspends the advancement of a printing medium, which is being  
3   fed by the rotation of a feeding roller, by a registering roller located  
4   forward of said printing medium, comprising:  
5           mode designation receiving means for receiving the designation of  
6   double-side printing mode in which both surfaces of the printing medium  
7   are target surfaces to be printed;

8 command generating means for generating a command, upon  
9 receipt of the designation of said double-side printing mode by said  
10 mode designation receiving means, for rotating said registering roller in  
11 the direction to move said printing medium backward before restart of  
12 advancement and rotating said feeding roller in accordance with the  
13 rotation of said registering roller in order to feed said printing medium  
14 for printing a second image that is to be printed later out of a pair of  
15 images to be printed on both surfaces of said printing medium; and  
16 command issuing means for issuing said command generated by  
17 said command generating means as said command to be supplied to said  
18 printer.

1 3. A printer control unit as set forth in Claim 2 further  
2 comprising detecting means for detecting information on the quantity of  
3 ink used for printing a first image which is to be printed ahead of the  
4 other one of said pair of images, characterized in that said command  
5 generating means generates a command for rotating said registering roller  
6 and said feeding roller at a rotational speed in accordance with  
7 information detected by said detecting means on said first image to be  
8 printed in combination with said second image as a command for feeding  
9 said printing medium for printing said second image.

1 4. A printer control unit as set forth in Claim 2, characterized in  
2 that said command generating means generates a command for rotating  
3 said registering roller and said feeding roller at a rotational speed in



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1           7. A storage medium having a program stored therein for  
2 controlling a printing mechanism that suspends the advancement of a  
3 printing medium, which is being fed by the rotation of a feeding roller,  
4 once by a registering roller located forward of said printing medium,  
5 characterized in that said program makes a printer control unit for  
6 controlling said printing mechanism execute;

7           a printing mode designation receiving process for receiving the  
8 designation of double-side printing mode in which both surfaces of the  
9 printing medium are target surfaces to be printed;

10           a command generating process for generating a feed command,  
11 upon receipt of the designation of said double-side printing mode, for  
12 rotating said registering roller in the direction to move said printing  
13 medium backward before restart of advancement and for rotating said  
14 feeding roller in accordance with the rotation of said registering roller in  
15 order to feed said printing medium for printing a second image that is to  
16 be printed later out of a pair of images to be printed on both surfaces of  
17 said printing medium; and

18           a command issuing process for issuing said feed command  
19 generated by said paper feed command generating process.

1           8. A storage medium as set forth in Claim 7, characterized in that  
2 when double-side printing mode is designated, said program makes said  
3 printer control unit execute a detecting process for detecting information  
4 on the quantity of ink used for printing a first image which is to be  
5 printed ahead of the other one of said pair of images, and generate a

6 command for rotating said registering roller and said feeding roller at a  
7 rotational speed in accordance with the detected information on the first  
8 image paring with said second image.

1 9. A storage medium as set forth in Claim 6, characterized in that  
2 said program makes said printer control unit generate a command for  
3 rotating said registering roller and said feeding roller at a rotational speed  
4 in accordance with a type of said printing medium as a feed command for  
5 feeding said printing medium for printing said second image.

1 10. A storage medium as set forth in Claim 7, characterized in  
2 that said program makes said printer control unit generate a command for  
3 rotating said registering roller and said feeding roller at a rotational speed  
4 in accordance with a type of said printing medium as a feed command for  
5 feeding said printing medium for printing said second image.

1 11. A printer control unit for issuing a command to be supplied  
2 to a printer that is able to print images on both surfaces of a printing  
3 medium, comprising:

4 mode designation receiving means for receiving the designation of  
5 double-side printing mode in which both surfaces of the printing medium  
6 are target surfaces to be printed;

7 command generating means for generating a command, upon  
8 receipt of the designation of double-side printing mode by said printing  
9 mode designation receiving means, for delaying the start of feeding the

10 printing medium for printing a second image which is to be printed later  
11 out of a pair of images having consecutive page numbers among a  
12 plurality of images to be printed by said printer; and  
13 command issuing means for issuing the command generated by  
14 said command generating means as said command.

1 12. A printer control unit as set forth in Claim 11, further  
2 comprising detecting means for detecting information on the quantity of  
3 ink used for printing a first image which is to be printed ahead of the  
4 other one of said pair of images,

5 characterized in that said command generating means generates  
6 the command for delaying the start of feeding the printing medium for  
7 printing the second image as long as the period of time corresponding to  
8 the waiting time according to information detected by said detecting  
9 means on a first image paring with said second page.

1 13. A printer control unit as set forth in Claim 11, further  
2 comprising printing condition storing means which stores information on  
3 waiting times in correspondence with at least one of a type of printing  
4 medium and a type of ink, characterized in that said command generating  
5 means reads the waiting time corresponding to at least one of the type of  
6 printing medium on which said second image is printed and the type of  
7 ink used for printing the first image paring with said second image, from  
8 said printing condition storing means, and generates the command for  
9 delaying the start of feeding the printing medium for printing said second

10 image as long as the period of time corresponding to said waiting time.

1 14. A printer control unit as set forth in Claim 12, characterized  
2 in that said command generating means reduces waiting time before  
3 starting feeding the printing medium for printing said second image  
4 according to the time elapsed since printing of said first image is finished.

1 15. A printer control unit as set forth in Claim 13, characterized  
2 in that said command generating means reduces waiting time before  
3 starting feeding the printing medium for printing said second image  
4 according to the time elapsed since printing of said first image is finished.

1 16. A printer control unit as set forth in Claim 11, characterized  
2 in that in the case where said printer is a printer of the type which  
3 suspends the advancement of the printing medium, which is fed by the  
4 rotation of a feeding roller, by a registering roller located forward of said  
5 printing medium, said command generating means incorporates an  
6 instruction for rotating said registering roller in the direction to move said  
7 printing media backward and rotating said feeding roller according to the  
8 rotation of said registering roller, into the command for delaying the start  
9 of feeding the printing medium for printing said second image.

1 17. A printer control unit as set forth in Claim 12, characterized  
2 in that in the case where said printer is a printer of the type which  
3 suspends the advancement of the printing medium, which is fed by the

4 rotation of a feeding roller, by a registering roller located forward of said  
5 printing medium, said command generating means incorporates an  
6 instruction for rotating said registering roller in the direction to move said  
7 printing media backward and rotating said feeding roller according to the  
8 rotation of said registering roller into the command for delaying the start  
9 of feeding the printing medium for printing said second image.

1 18. A printer control unit as set forth in Claim 13, characterized  
2 in that in the case where said printer is a printer of the type which  
3 suspends the advancement of the printing medium, which is fed by the  
4 rotation of a feeding roller by a registering roller located forward of said  
5 printing medium, said command generating means incorporates an  
6 instruction for rotating said registering roller in the direction to move said  
7 printing media backward and rotating said feeding roller according to the  
8 rotation of said registering roller into the command for delaying the start  
9 of feeding the printing medium for printing said second image.

1 19. A printer control unit as set forth in Claim 14, characterized  
2 in that in the case where said printer is a printer of the type which  
3 suspends the advancement of the printing medium, which is fed by the  
4 rotation of a feeding roller by a registering roller located forward of said  
5 printing medium, said command generating means incorporates an  
6 instruction for rotating said registering roller in the direction to move said  
7 printing media backward and rotating said feeding roller according to the  
8 rotation of said registering roller into the command for delaying the start



9 of feeding the printing medium for printing said second image.

1           20. A printer control unit as set forth in Claim 15, characterized  
2 in that in the case where said printer is a printer of the type which  
3 suspends the advancement of the printing medium, which is fed by the  
4 rotation of a feeding roller by a registering roller located forward of said  
5 printing medium, said command generating means incorporates an  
6 instruction for rotating said registering roller in the direction to move said  
7 printing media backward and rotating said feeding roller according to the  
8 rotation of said registering roller into the command for delaying the start  
9 of feeding the printing medium for printing said second image.

1           21. A storage medium including a program for allowing a printer  
2 control unit to issue a feed command to a printer which is able to print  
3 images on both surface of a printing medium;

4       said program allowing said printer control unit to execute:

5           a detecting process for detecting information on the quantity of  
6 ink used for printing a first image which is to be printed ahead of the  
7 other one of said pair of images having consecutive page numbers to be  
8 printed by said printer;

9           a mode designation receiving process for receiving the designation  
10 of double-side printing mode in which both surfaces of the printing  
11 medium are target surfaces to be printed;

12           a command generating process for generating a command for  
13 delaying the start of feeding the printing medium for printing a second

14 image as long as the period of time corresponding to the waiting time  
15 according to the detected information on said first image paring with said  
16 second; and

1           22. A printer control unit for issuing a command to be supplied  
2   to an ink jet printer, comprising:

5           transmit-receive means for making an inquiry about said ink jet  
6   printer whether or not the double-side printing is possible when double-  
7   side printing mode is designated by said mode designation means,  
8   receiving a response to said inquiry, and issuing a printing command as  
9   said command; and

10       printing command generating means for:

13       generating a printing command for double-side printing mode as  
14       printing command to be issued by said transmit-receive means, and

17 relating to one of an odd-numbered page and an even-numbered page  
18 successively as printing command to be issued by said transmit-receive  
19 means, and then

20 generating a second printing command for one-side printing mode  
21 relating to the other one of the odd-numbered page and the even-  
22 numbered page successively as printing command to be issued by said  
23 transmit-receive means.

1 23. A printer control unit as set forth in Claim 22,  
2 characterized in that when said transmit-receive means completes  
3 the transmission of all of said first printing command, said transmit-  
4 receive means makes an inquiry about whether or not said ink jet printer  
5 has executed printing according to all of said first printing command, and  
6 receives a response to said inquiry; and  
7 in that said printer control unit further comprises, when said  
8 transmit-receive means receives the response indicating that printing  
9 according to all of said first printing command is finished, output means  
10 for outputting the response.

1 24. A printer control unit as set forth in Claim 22, further  
2 comprising:  
3 margin setting means for setting a margin of at least one of an  
4 odd-numbered page and an even-numbered page; and  
5 automatic remaining margin setting means for setting a margin in  
6 such a manner that, when double-side printing mode is designated by  
7 said mode designation means and the margin for one of said odd-  
8 numbered page and said even-numbered page is set by said margin  
9 setting means, the right margin of one of the pages of which the margins

10 are not set is set to the same width as the left margin of the other page of  
11 which said margins are set, and the left margin of one of the pages of  
12 which the margins are not set is set to the same width as the right margin  
13 of the other page of which said margins are set.

1 25. A printer control unit as set forth in Claim 24 further  
2 comprising display means for displaying a printing medium for the odd-  
3 numbered page and a printing medium for the even-numbered page, and  
4 for displaying margins set by said margin setting means and said  
5 automatic remaining margin setting means.

1 26. A printer control unit as set forth in Claim 22, further  
2 comprising;

3 drawing command generating means for generating a drawing  
4 command which serves as a source when said printing command  
5 generating means generates said printing command, and specifying a  
6 printing area on the printing medium for printing based on said drawing  
7 command; and

8 margin setting means for setting a margin on the printing medium  
9 for executing a printing job based on said printing command.

10 characterized in that said print command generating means  
11 comprises:

12 drawing means for rasterizing said drawing command into an  
13 image; and

14 drawing control means for controlling said drawing means in such

15 a manner that when a part of the printing area specified by said drawing  
16 command generating means is overlapped with said margin as a result of  
17 setting the margin by said margin setting means, said drawing command  
18 for one page is rasterized into a downsized image so that the image for a  
19 page fits into the area that is not overlapped with said margin in said  
20 printing area.

1 27. A printer control unit as set forth in Claim 22, further  
2 comprising output means that outputs a message for confirming whether  
3 or not ink for double-side printing is installed in said ink jet printer when  
4 double-side printing mode is designated by said mode designation means.

1 28. A printer control unit as set forth in Claim 23, further  
2 comprising output means that outputs a message for confirming whether  
3 or not ink for double-side printing is installed in said ink jet printer when  
4 double-side printing mode is designated by said mode designation means

1 29. A printer control unit as set forth in Claim 22, further  
2 comprising;

3 reversing time setting means for setting a reversing time  
4 required for reversing the printing medium after printing on one of  
5 surfaces of a printing medium is finished and be ready for printing on the  
6 other surface thereof, and transmitting said reversing time via said  
7 transmit-receive means when said ink jet printer is in double-side printing  
8 mode.

1           30. A printer control unit as set forth in Claim 23, further  
2 comprising;

3           reversing time setting means for setting a reversing time  
4 required for reversing the printing medium after printing on one of  
5 surfaces of a printing medium is finished and be ready for printing on the  
6 other surface thereof, and transmitting said reversing time via said  
7 transmit-receive means when said ink jet printer is in double-side printing  
8 mode.

1           31. A printer control unit as set forth in Claim 29, further  
2 comprising:

3           printing medium type designation means for designating a type of  
4 the printing medium; and

5           storage means for storing the relation between the type of the  
6 printing medium that can be specified by said printing medium type  
7 specifying means and the reversing time;

8           characterized in that when the type of the printing medium is  
9 specified by said printing medium type specifying means, said reversing  
10 time setting means refers to the stored contents in said storage means and  
11 sets the reversing time corresponding to said type of the printing medium.

1           32. A printer control unit as set forth in Claim 30, further  
2 comprising:

3           printing medium type designation means for designating a type of  
4 the printing medium; and

5 storage means for storing the relation between the type of the  
6 printing medium that can be specified by said printing medium type  
7 specifying means and the reversing time;

8 characterized in that when the type of the printing medium is  
9 specified by said printing medium type specifying means, said reversing  
10 time setting means refers to the stored contents in said storage means and  
11 sets the reversing time corresponding to said type of the printing medium.

1           33. An ink jet printer that jets ink from a printing head to print  
2 on a printing medium according to a printing command supplied from a  
3 printer control unit,

4 wherein said ink jet printer permits installation of a reversing  
5 mechanism for reversing said printing medium after one of the surfaces of  
6 said printing medium is printed, and guiding the printing medium so that  
7 the other surface of the printing medium faces toward said printing head,  
8 comprising:

9 installation detecting means for detecting whether or not said  
10 printing medium reversing mechanism is installed;

11 transmit-receive means working in such a manner that:

12           when said printing command and the inquiry about whether or  
13   not double-side printing is possible are received from said printer control  
14   unit; and

15           when said installation detecting means detects the installation of  
16   said printing medium reversing mechanism, a response indicating that  
17   double-side printing is possible is returned, and

18           when said installation detecting means does not detect the  
19 installation of said printing medium reversing mechanism, a response  
20 indicating that double-side printing is not possible is returned.

1           34. An ink jet printer as set forth in Claim 33, further comprising  
2 said reversing mechanism.

1           35. An ink jet printer for jetting ink from a printing head and  
2 printing on a printing medium according to a printing command from a  
3 printer control unit, comprising;

4           a reversing mechanism for reversing said printing medium after  
5 one of the surfaces of said printing medium is printed, and guiding the  
6 printing medium so that the other surface of the printing medium faces  
7 toward said printing head; and

8           transmit-receive means for receiving said printing command from  
9 said printer control unit and an inquiry about whether or not double-side  
10 printing is possible and making a response indicating that double-side  
11 printing is possible.

1           36. A printer system comprising:

2           a printer control unit; and

3           an ink jet printer for jetting ink from a printing head and printing  
4 on a printing medium according to a printing command from a printer  
5 control unit;

6           said printer control unit comprising;



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7           mode designation means for designating of the mode between  
8 double-side printing mode and one-side printing mode;  
9           transmit-receive means for making an inquiry whether or not said  
10 ink jet printer is able to execute double-side printing when double-side  
11 printing mode is designated by said mode designation means, receiving a  
12 response to said inquiry, and issuing the generated printing command;  
13 and  
14           printing command generating means for:  
15           when said transmit-receive means receives a response representing  
16 that double-side printing is possible,  
17           generating a printing command for double-side printing mode as  
18 printing command to be issued by said transmit-receive means, and  
19           when said transmit-receive means receives other responses,  
20           generating a first printing command for one-side printing mode  
21 relating to one of an odd-numbered page and an even-numbered page  
22 successively as printing command to be issued by said transmit-receive  
23 means, and then  
24           generating a second printing command for one-side printing mode  
25 relating to the other one of the odd-numbered page and the even-  
26 numbered page successively as printing command to be issued by said  
27 transmit-receive means,  
28           said ink jet printer is characterized in that a reversing mechanism  
29 for reversing said printing medium after one of the surfaces of said  
30 printing medium is printed, and guiding the printing medium so that the  
31 other surface of the printing medium faces toward said printing head is





37 other page of which said margins are set;

38 display means for displaying the printing medium for the odd-  
39 numbered page and the printing medium for the even-numbered page,  
40 and for displaying margins set by said margin setting means and said  
41 automatic remaining margin setting means;

42 said ink jet printer is characterized in that a reversing mechanism  
43 for reversing said printing medium after one of the surfaces of said  
44 printing medium is printed, and guiding the printing medium so that the  
45 other surface of the printing medium faces toward said printing head is  
46 installable, comprising:

47 installation detecting means for detecting whether or not said  
48 printing medium reversing mechanism is installed;

49 transmit-receive means working in such a manner that:

50 when said printing command and the inquiry about whether or  
51 not double-side printing is possible are received from said printer control  
52 unit: and

53 when said installation detecting means detects the installation of  
54 said printing medium reversing mechanism, a response indicating that  
55 double-side printing is possible is returned, and

56 when said installation detecting means does not detect the  
57 installation of said printing medium reversing mechanism, a response  
58 indicating that double-side printing is not possible is returned.

1 38. A storage medium having a program of a printer control unit  
2 including transmit-receive means for issuing a command to an ink jet



